

tyco

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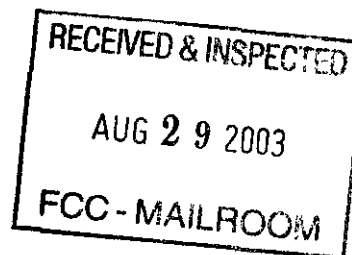
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M/A-COM Inc
221 Jefferson Ridge Parkway
P.O. Box 2000
Lynchburg VA 24501

Tele 434 455 6600

M/A-COM

August 25, 2003



Marlene H. Dortch, Esq.
Office of the Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, DC 20554

RE: Corrected M/A-COM Petition for Reconsideration, WT 99-87, electronically filed
August 22, 2003

Dear Ms. Dortch

Enclosed is a hard copy of the corrected Petition for Reconsideration, which was
filed through the Commission's ECFS on Friday, August 22nd. The confirmation number
for the electronic filing is 2003822043085.

If there are any questions, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Speidel".

Robert J. Speidel, Esq.
Manager, Regulatory Policy

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List ABOVE

tyco
Electronics

M/A-COM

M/A-COM
221 Jefferson Ridge
Parkway
P O Box 2000
Lynchburg, VA 24501

Telephone (434) 455-
6600

August 22, 2003

Marlene H. Dortch, Esq.
Office of the Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, DC 20554

ELECTRONIC FILING

RE: Corrected Petition for Reconsideration, WT 99-87

Dear Ms. Dortch:

Attached is an edited version of the M/A-COM Petition for Reconsideration that was filed in the above referenced docket on Monday, August 18th.

While further reviewing the previously filed document, I noted some errors that had been initially missed. Also, in this version of the document, I took the opportunity to supplement the channel listings in Appendix B indicating appropriate Station Class Codes, Limitations, and Frequency Coordinators. I have also included corrected channel numbers in all of the listings in Appendix A and Appendix B. There are no substantive changes to the information initially included in the petition that I filed on August 18th.

For your information I am also providing copies of the improved/updated petition, via USPS, to the relevant Legal Advisor of each Commissioner; to the Chief and Deputy Chief of the Wireless Telecommunications Bureau; and to the Chief, Deputy Chief for Public Safety, and Deputy Chief for Technical of the Public Safety and Private Wireless Division.

If there are any questions, please do not hesitate to contact me.

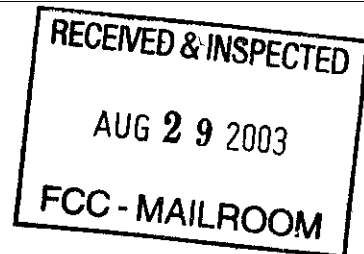
Sincerely,



Robert J. Speidel, Esq.
Manager, Regulatory Policy

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SUMMARY

In the *Second Report and Order* the Commission has addressed the need to mandate utilization of spectrally efficient equipment in the Commission's 150-174 MHz and 450 – 512 MHz spectrum bands. Previously, as a result of the *Refarming* proceeding, the Commission mandated manufacturers to produce increasingly efficient equipment. The Commission now realizes mandating efficiency requirements on equipment manufacturers alone has not resulted in more efficient utilization of the spectrum.

The Commission is to be applauded for this attempt to improve the efficient use of this 150-174 MHz and 450 – 512Mhz frequency bands. However, the rules adopted by the Commission in the *Second Report and Order* unnecessarily restrict realization of efficient spectrum utilization. The Commission erred by adopting rules that:

- Are inconsistent with the request made by AMTA in its Petition for Rulemaking;
- Are contrary to the Commission's policy of adopting rules that are technologically neutral, and;
- Are apparently based on a misinterpretation of the Commission's *Refarming* spectrum efficiency requirements placed on manufacturers

The actions taken by the Commission in the *Second Report and Order* do not appear to serve the *public interest*.

If the Commission does not amend the rules adopted in the *Second Report and Order* to allow the use of all spectrally efficient technologies by allowing channel bandwidths up to 25 kHz provided certain spectral efficiency requirements are met, the Commission will seriously compromise future realization of efficient spectrum use.

Furthermore, focusing solely on channel bandwidths as the only means for efficient spectrum use may unnecessarily complicate the realization of more efficient technologies as proposed in the *Further Notice of Proposed Rulemaking*

M/A-COM, therefore, respectfully suggests the Commission reconsider the decisions in the *Second Report and Order* as particularly described hereinafter and allow channel bandwidths greater than 12.5 kHz, provided such use satisfies appropriate voice and data spectrum efficiency standards. M/A-COM recommends the Commission adopt specific language for relevant sections of §90.20, §90.35, §90.203, and §90.209 of the Commission's rules in order to facilitate the retention of 25 kHz channel bandwidths while at the same time requiring increased spectrum efficiency.

This petition, however, does not suggest the elimination of mandated dates when users must employ spectrally efficient technologies. M/A-COM believes the user communities are better qualified to address the appropriateness of the dates selected for mandated transition. In any case, M/A-COM will take the necessary steps to provide compliant equipment by whatever dates are ultimately selected by the Commission based on appropriate user input.

RECEIVED & INSPECTED
AUG 29 2003
100C - MAILROOM

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C.**

In the Matter of)	
)	
Implementation of Sections 309(j) and 337)	WT Docket No. 99-87
of the Communications Act of 1934 as)	
Amended)	
)	RM-9332
Promotion of Spectrum Efficient)	
Technologies on Certain Part 90)	
Frequencies)	

Petition for Reconsideration of the Second Report and Order filed by M/A-COM, Inc.

To the Commission

INTRODUCTION

M/A-COM, Inc. ("M/A-COM"), pursuant to Section 1.429 of the Commission's rules¹ respectfully submits this Petition for Reconsideration of the Commission's *Second Report and Order*² in the above-captioned proceeding.

In this *Petition*, M/A-COM seeks reconsideration of maximum 12.5 kHz channel bandwidth limitations adopted in the *Second Report and Order*. First, M/A-COM applauds the

¹ 47 C.F.R. §1.429

Commission for attempting to improve the spectrally efficient use of the relevant spectrum. However, M/A-COM believes the Commission's attempt to implement more spectrally efficient use of the relevant spectrum by focusing solely on bandwidth limitations is misguided. As a result, this petition includes a request for the Commission to reconsider its decision to limit channel bandwidths to 12.5 kHz. There are good and legally sufficient reasons why the Commission can and should reconsider its decision to limit channel bandwidths to 12.5 kHz in the 150-174 MHz and 450-512 MHz frequency bands. This petition includes revised language for the important rules sections that should be modified. The requested modifications are intended to enhance rather than hinder the Commission's courageous attempt to improve spectrally efficient utilization of the relevant spectrum.

BACKGROUND

M/A-COM is a longstanding provider of electronic equipment to the Land Mobile Radio market. M/A-COM is also the successor in interest to Ericsson GE Mobile Communications, Ericsson Private Radio Systems ("Ericsson") and Com-Net Ericsson Critical Communications, Inc. ("Com-Net"). Tyco Electronics, acquired Com-Net in May of 2001, and established M/A-COM Private Radio Systems, Inc. as an operating component of its M/A-COM Wireless Systems Business unit. In December of 2002, M/A-COM Private Radio Systems, Inc. officially changed its name to M/A-COM, Inc. to better reflect the continuing integration of the former Com-Net entity into the M/A-COM family of companies.

M/A-COM and its predecessors have long been actively involved in the private radio business. The Tyco Electronics acquisition merged the expertise developed by Com-Net and its predecessors through its Enhanced Digital Access Communications Systems (EDACS[®]) with the expertise developed within M/A-COM through its advanced digital OpenSky[®] communications system.

² Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended, WT Docket No. 99-87, and Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies, RM-9332, Second Report and Order, (2003), adopted February 14, 2003, released February 25, 2003 ("*Second Report and Order*")

M/A-COM and its predecessors have long been active participants in a number of Commission proceedings, including *Refarming*.³ The *Refarming* proceeding is particularly relevant to the issues in the instant proceeding. *Refarming* is the proceeding wherein the Commission imposed efficiency mandates on the manufacturing community for equipment that is used in the same 150-174 MHz and 450-512 MHz frequency bands. It is also the *Refarming* proceeding wherein the Commission explicitly recognized the concept of “equivalent spectrum efficiency” and the key role this concept plays. The efficiency requirements placed upon the manufacturing community as part of the *Refarming* proceeding specifically allowed manufacturers to choose between channel bandwidth limitations and other efficiency techniques employing wider channel bandwidths as the means for satisfying the Commission’s efficiency requirements.⁴ Many manufacturers have now developed or begun to develop products to satisfy the Commission’s 2005 *Refarming* efficiency mandates. It must be noted that in many cases such equipment employs efficiency techniques other than actual channel bandwidth limitations. If the rules as established in the *Second Report and Order* remain as adopted much of this new equipment will be precluded and any investments already made will be lost.

Additionally, M/A-COM and its predecessors have been active participants in a number of advisory committees dealing with the structure of the land mobile radio spectrum, particularly as such spectrum relates to public safety needs. Some of the output from these committees has formed the genesis of the *Public Safety Proceeding*,⁵ and have assisted in developing technical rules for the new 700 MHz public safety spectrum. In 1995 and 1996, Ericsson personnel were very active members of the Public Safety Wireless Advisory Committee (“PSWAC”) with one Ericsson employee serving as a member of the PSWAC Steering Committee. More recently, M/A-COM and its predecessors have been and continue to be very active members of the Public Safety National Coordination Committee (“NCC”).

³ Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them and Examination of Exclusivity and Frequency Assignments Policies of the Private Land Mobile Services, PR Docket No. 92-235 (“*Refarming*”).

⁴ See Memorandum Opinion and Order, PR Docket No. 92-235, FCC 96-492, 11 FCC Rcd 17696 (1996), adopted December 23, 1996 and released December 30, 1996.

⁵ The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, WT Docket No. 96-86 (“*Public Safety Proceeding*”).

Again a current M/A-COM employee has served on the NCC Steering Committee from the very beginning of the NCC in 1999.

As a result of its involvement, and the involvement of its predecessors, in the rulemaking proceedings and advisory committees M/A-COM has a particular appreciation for the Commission's efforts to improve the efficient utilization of the 150-174 MHz and 450-512 MHz land mobile frequency bands. M/A-COM is fully aware of the many challenges faced by the Commission. However, M/A-COM knows the rules adopted in the *Second Report and Order* likely will not best satisfy the public interest of improved efficiency in the 150-174 MHz and 450-512 MHz land mobile frequency bands. Furthermore, M/A-COM is concerned the rules adopted in the *Second Report and Order* will have a seriously negative effect on the Commission's attempt to improve interoperability in all public safety frequency bands.

M/A-COM and its predecessors have long been strong advocates of the need to achieve maximum voice spectrum efficiency, consistent with available technology, as soon as possible. Therefore, M/A-COM feels compelled to offer its suggestions for improving the rules through this Petition for Reconsideration.

DISCUSSION

A. General

In the *Second Report and Order* the Commission has implemented a number of rules changes intended to improve the spectrally efficient use of the 150-174 MHz and 450-512 MHz land mobile radio bands. While the instant proceeding is independent of the *Refarming*⁶ proceeding M/A-COM believes the rules adopted in the instant proceeding are intended to supplement the rules adopted in the *Refarming* proceeding. Unfortunately much of the discussion in the *Second Report and Order* as well as the rules adopted in the *Second Report and Order* are inconsistent with policies expressed in the *Refarming* proceeding. As a result

⁶ See footnote 3, *supra*

these new rules may frustrate realization of spectrally efficient use of the 150-174 MHz and 450-512 MHz land mobile radio bands.

Specifically, in the *Second Report and Order* the Commission has taken the following actions.

- Prohibition of any license applications for new operations **using 25 kHz** (emphasis added) channels, beginning six months after publication of the *Second Report and Order* in the Federal Register. (NB: According to the date of Federal Register publication, July 17, 2003, this date would be January 17, 2004, or January 19, 2004 if the intention is to reflect the fact January 17, 2004 is a Saturday. However, the actual notice included in the Federal Register publication shows this date as January 13, 2004.)
- Prohibition of any license modification applications that expand the authorized contour of an existing station if the **bandwidth** for transmissions specified in the modification application is **greater than 12.5 kHz** (emphasis added), beginning six months after publication of the *Second Report and Order* in the Federal Register. (NB: The actual date is as noted above)
- Prohibition on the certification of any equipment **capable** of operating at one voice path per 25 kHz of spectrum, *i.e. equipment that includes a 25 kHz mode*, (emphasis added) beginning January 1, 2005.
- Prohibition on the manufacture and importation of any 150-174 MHz and 421-512 MHz band equipment **that can operate on a 25 kHz bandwidth** (emphasis added) beginning January 1, 2008.
- Imposition of deadlines for **migration to 12.5 kHz technology** (emphasis added) for private land mobile radio services (PLMRS) systems operating in the 150-174 MHz and 421-512 MHz bands. The deadlines are January 1, 2013 for non-public safety systems and January 1, 2018 for public safety systems.

The language used above is indicative of the imprecise language used throughout the *Second Report and Order*. In some aspects the language refers to “bandwidth” and in other places it refers to “technology.” As demonstrated in the *Refarming* proceeding and as expressed in numerous Commission statements of policy, the two terms “bandwidth” and “technology” are not necessarily interchangeable. When the terms are used, albeit incorrectly, interchangeably, the results and interpretations are often anomalous. In fact, improper uses of the terms will likely precipitate results contrary to Commission intentions.

The rules adopted in the *Second Report and Order* are examples of the deleterious effect caused by imprecise use of the terms “bandwidth” and “technology.” The anomalous results cause by the *Second Report and Order* warrants the Commission’s attention to react positively to this Petition for Reconsideration.

B. Petition Rationale

There must be a legal basis supporting a Petition for Reconsideration. The Petitioner must be able to show the Commission made an error in application of the information used to support the decision or the Petitioner must proffer new evidence showing the decision is inappropriate, which such new evidence was unavailable to provide to the Commission in a timely manner.⁷ Merely disagreeing with decisions made by the Commission in a Report and Order is not a sufficient legal basis.

There are a number of grounds making this Petition legally sufficient for the Commission to act.

First, the Commission has adopted rules that are inconsistent with the original request made by the American Mobile Telecommunications Association (AMTA) in its Petition for Rulemaking⁸. As stated in the Further Notice of Proposed Rulemaking⁹ addressing the AMTA request, the Commission noted AMTA requested utilization of spectrum efficient technologies, not necessarily technologies that utilize a maximum 12.5 kHz channel bandwidth.

“On June 19, 1998, AMTA filed a petition for rule making proposing that certain Part 90 licensees be required to employ new spectrum-efficient **technologies** (emphasis added)

⁷ See, e.g., 800 Data Base Access Tariffs and the 800 Service Management System Tariff and Provision of 800 Services, 7 FCC Rcd 1753 (1992) and See also, Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act Part 73 Definition and Measurement of Signals of Grade B Intensity, Order on Reconsideration, 14 FCC Rcd 17373 (1999), Elimination of Telephone Company-Cable Cross Ownership Rules, Sections 63.54-63.56, for Rural Areas, 91 FCC 2d 622 (1982); Amendment of Section 73.636(a) of the Commission’s Rules (Multiple Ownership of Television Stations), 82 FCC 2d 329 (1980)

⁸ AMTA Petition for Rulemaking (RM-9332) (filed June 19, 1998) (AMTA Petition I)

⁹ Further Notice of Proposed Rulemaking In the Matter of Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended (WT Docket No. 99-87), Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies (RM-9332), Establishment of Public Service Radio Pool in the Private Mobile Frequencies Below 800 MHz (RM-9405), and Petition for Rule Making of The American Mobile Telecommunications Association (RM-9705), FCC 00-403, dated November 9, 2000 and released November 20, 2000 (hereinafter *Further Notice of Proposed Rulemaking*)

Specifically, AMTA urges that non-Public Safety licensees in the bands between 222 MHz and 896 MHz be required to deploy technology that achieves the equivalent of two times the capacity of most current operations. **The gain in efficiency would result in one voice path per 12.5 kilohertz of spectrum, using a 25 kilohertz frequency** (emphasis added).¹⁰

Furthermore, in the *FNPRM* the Commission also misstates its own rules regarding the efficiency requirements imposed on manufacturing companies as a result of the *Refarming* proceeding

“Specifically, since February 14, 1997, we have certified equipment for 25 kilohertz channels only if it is also capable of operating on 12.5 kilohertz and/or narrower channels. After January 1, 2005, only new equipment that operates on 6.25 kilohertz channel bandwidths will be certified. New equipment that operates on 25 and/or 12.5 kilohertz channels will be certified only if it is also capable of operating on 6.25 kilohertz or narrower channels.”¹¹

The above statement of the rules specifically ignores the provisions of §§90.203(j)(2)(iii), 90.203(j)(3), 90.203(j)(4)(iv) and 90.203(j)(5)¹² as such have existed since the late 1990’s. §§ 90.203(j)(2)(iii) and 90.203(j)(3) specifically allow certification of equipment with bandwidths up to 25 kHz provided they have an efficiency of one voice path per 12.5 kHz of bandwidth as of February 14, 1997. §§ 90.203(j)(4)(iv) and 90.203(j)(5) specifically allow certification of equipment with bandwidths up to 25 kHz provided they have an efficiency of one voice path per 6.25 kHz of bandwidth as of January 1, 2005. While the rules adopted in the *Second Report and Order* have inappropriately deleted the provisions of §§90.203(j)(2)(iii) and 90.203(j)(4)(iv) it should be noted, at this point, neither § 90.203(j)(3) nor § 90.203(j)(5) was modified or deleted by the *Second Report and Order*.

Essentially, the rules adopted in the *Second Report and Order* are inconsistent with both the AMTA request and any rule changes contemplated by the AMTA request.

¹⁰ *FNPRM* at paragraph 137

¹¹ *Id.* at paragraph 138

¹² 47 C.F.R. 90.203(j)(3) and 47 C.F.R. 90.203(j)(5)

Second, Commission errors in adopting the rules in the *Second Report and Order* are further evidenced by reference to the actual language of the *Second Report and Order*. Specifically, the *Second Report and Order* states:

“In that connection, the Commission added NB technology **or NB equipment will include** all advanced technologies designed to operate with channel bandwidths of 6.25 kHz or less or **equipment with 6.25 kHz equivalent efficiency such as TDMA (2 channels in 12.5 kHz or 4 channels in 25 kHz)** (emphasis added)”¹³

The Commission also defines narrowband equipment in the *Second Report and Order* as equipment that meets an efficiency standard of 1 voice path per 12.5 kHz of bandwidth.

“For the purposes of this 2nd R&O ., narrowband technology will refer to utilization of one voice path per 12.5 kHz of spectrum.”¹⁴

In the *Second Report and Order* the Commission also explains it is the Commission’s intention to encourage migration to narrowband technology¹⁵ by adopting rules requiring migration to “narrowband technology” over a ten year period. 4-slot TDMA solutions are included in the definition of “narrowband technology” or “narrowband equipment” as defined above, however, the rules adopted in the *Second Report and Order* exclude equipment channel bandwidths in excess of 12.5 kHz. It is, therefore, clear the language of the *Second Report and Order* does not support the limitations expressed in the adopted rules.

The Commission’s failure to pay heed to its own definitions in the *Second Report and Order* and assure that the rules adopted were consistent with such definitions is further evidence of the sufficiency of the basis for this petition.

Third, the Commission has long espoused a policy that the rules it adopts should not favor one technical solution over another. In other words the Commission intends its’ rules to be technically neutral to the maximum extent reasonable.

The rules adopted in the *Second Report and Order* do not meet the Commission policy of technical neutrality. There is no argument the rules adopted preclude utilization of spectrally

¹³ *Second Report and Order*, footnote 6

¹⁴ *Second Report and Order*, footnote 10

efficient technologies that were previously allowed and in fact encouraged. Highly efficient technologies, such as 4-slot Time Division Multiple Access (TDMA) providing 4 voice paths in a 25 kHz channel, the equivalent of 1 voice path per 6.25 kHz of bandwidth are no longer allowed in the 150-174 MHz and 450-512 MHz land mobile radio frequency bands. This is particularly onerous in the 470-512 MHz T-Band where exclusive channel assignments are possible, thereby facilitating the implementation of existing 4-slot solutions. Furthermore, additional complementary developments are underway, which are intended to facilitate the utilization of 4-slot technologies in the 150-174 MHz and 450-470 MHz bands shared land mobile radio spectrum while still complying with the concurrence requirements of § 90.187¹⁶. Elimination of channel bandwidths in excess of 12.5 kHz, even for equipment demonstrating spectrum efficiency in excess of what is required by the *Second Report and Order*, also means the investment in these complementary developments, which has already been made, has been largely wasted

In addition to the errors and inconsistencies in the *Second Report and Order*, the Commission's inability to describe its' pre-existing rules' requirements correctly; and the failure of the adopted rules to maintain the Commission's policy of technical neutrality; there is another negative effect the Commission may not have adequately considered. This additional negative effect is the inappropriate utilization of additional R&D dollars already expended.

In the *Refarming* proceeding, the Commission imposed efficiency requirements on manufacturers. As of January 1, 2005, the pre-existing Commission rules required equipment submitted for certification must have 6.25 kHz **OR EQUIVALENT** efficiency, if such equipment is for the 150-174 MHz and/or 450-512 MHz land mobile radio frequency bands. Because of this requirement, which has been known by the manufacturers and the Commission since the late 1990's, many manufacturers have already invested significant dollars

¹⁵ *Second Report and Order* paragraph 12

¹⁶ 47 C F R 90.187

developing the necessary technologies. Many of the technologies being developed by numerous manufacturers utilize channel bandwidths greater than 12.5 kHz while at the same time providing at least 1 voice path per 6.25 kHz of bandwidth. If the rules, as adopted in the *Second Report and Order* are allowed to stand these R&D investments in highly efficient equipment utilizing channel bandwidths greater than 12.5 kHz, which have been incurred pursuant to good faith reliance on the Commission's rules, will have been wasted.

All of the foregoing reasons provide a good and sufficient basis for the Commission to act favorably to the requests made in this petition. Namely the Commission should allow channel bandwidths in excess of 12.5 kHz provided the appropriate voice and/or data efficiency standards are met. The errors expressed herein, the mandated wasting of R&D dollars already expended, and the likelihood the rules currently adopted will minimize the realization of efficient spectrum use, all, individually and collectively, mandate the Commission to act favorably on the requests herein for channel bandwidths in excess of 12.5 kHz.

C. Changes to 47 C.F.R §§90.203 and 90.209

Before discussing the structure of the VHF and UHF bands as such bands exist after the *Second Report and Order* and the exact means the Commission should employ to provide for channel bandwidths greater than 12.5 kHz, M/A-COM believes there are a number of preliminary rules changes to propose. These recommended rules changes are independent of the exact manner in which the Commission decides to allow channel bandwidths up to 25 kHz. The recommended rules changes are also independent of the technologies manufacturers will employ to provide equipment satisfying the efficiency mandates placed on the user communities while at the same time satisfying the efficiency mandates placed on manufacturers as a result of the *Refarming* proceeding.

The first recommendation M/A-COM makes to allow for channel bandwidths greater than 12.5 kHz is to change the language of §90.203(j)(4) to read as follows:

(4) Applications for certification received on or after January 1, 2005, except for hand-held transmitters with an output power of two watts or less, will only be granted for equipment with the following channel bandwidths:

- (i) 6.25 kHz or less for single bandwidth mode equipment;
- (ii) 12.5 kHz for multi-bandwidth mode equipment with a maximum channel bandwidth of 12.5 kHz if it is capable of operating on channels of 6.25 kHz or less;
- (iii) Up to 25 kHz in single bandwidth mode equipment or multi-bandwidth mode equipment, if the single bandwidth mode equipment, or at least one channel bandwidth mode in multi-bandwidth mode equipment, meets the efficiency standard of paragraph (j)(5) of this section.

The above recommended change is necessary to indicate channel bandwidths greater than 12.5 kHz are clearly allowed, but at the same time the language also indicates such wider channel bandwidths are clearly contingent on the provision of spectrally efficient technologies.

The second rules change M/A-COM believes is necessary is modification of the language in §90.203(j)(10), which was added by the *Second Report and Order*, to read as follows:

- (10) Single bandwidth mode transmitters designed to operate in the 150-174 MHz and 421-512 MHz bands that only provide one voice path in 25 kHz capability shall not be manufactured in, or imported into, the United States after January 1, 2008.

M/A-COM realizes the Commission has a justifiable interest to ease the user transition to spectrally efficient operations by the relevant transition dates. Elimination of equipment that does not possess the required spectrum efficiency in any mode is a way to ease the user transition. However, for reasons of backward compatibility and interoperability up to the time that user transition is mandated, M/A-COM believes it is unwise for the Commission to mandate elimination of a less efficient mode from otherwise efficient multi-bandwidth mode equipment. The above recommended language allows retention of the less efficient mode in multi-bandwidth mode equipment thereby fostering backward compatibility and interoperability

until the time of mandated user transition, while not compromising the Commission's intent to improve the overall efficiency of operations in the VHF and UHF bands.

The third general rule change M/A-COM recommends concerns the language of footnote 3 under the Table in §90.209(b)(5). The footnote language should be changed to read:

3. Operations using equipment designed to operate with a 25 kHz channel bandwidth will be authorized a 20 kHz bandwidth. Operations using equipment designed to operate with a 12.5 kHz channel bandwidth will be authorized an 11.25 kHz bandwidth. Operations using equipment designed to operate with a 6.25 kHz channel bandwidth will be authorized a 6 kHz bandwidth. All non-public safety stations must operate with equipment that provides at least one voice path per 12.5 kHz beginning January 1, 2013. All public safety stations must operate with equipment that provides at least one voice path per 12.5 kHz beginning January 1, 2018.

At this point, M/A-COM notes it believes the mandated transition dates for the user communities included in the revised footnote 3 language above, may change. M/A-COM recommends these dates be changed based on input from the various user Petitions for Reconsideration.

As a last general recommendation M/A-COM believes the language in §90.209(b)(6) should be changed. The purpose of this recommended change is to provide the user communities with full operational flexibility up to the time of the relevant transition date without compromising the Commission's intent to achieve spectrally efficient operations. M/A-COM recommends §90.209(b)(6) be modified to read as follows.

(6) No new applications for the 150-174 MHz and/or 421-512 MHz bands will be acceptable for filing if the applicant utilizes channels with a bandwidth exceeding 11.25 kHz after the relevant transition date outlined in footnote 3 to the Table in 90.209(b)(5), unless such use will provide at least 1 voice path per 12.5 kHz of channel bandwidth. If such new use will provide at least 1 voice path per 12.5 kHz of channel bandwidth the applicant may propose to use channel bandwidths up to 25 kHz. No modification applications for stations in the 150-174 MHz and/or 421-512 MHz bands that increase the station's authorized interference contour will be acceptable for filing if the applicant utilizes channels with a bandwidth exceeding 11.25 kHz, after the relevant transition date outlined in footnote 3 to the Table in 90.209(b)(5) unless such use will provide at least 1 voice path per 12.5 kHz of channel bandwidth. If such modified use will provide at least 1 voice path per 12.5 kHz of channel bandwidth the applicant may propose to use channel bandwidths up to 25 kHz.

D. Changes to structure of 150-174 MHz & 450-512 MHz bands

After the adoption of the *Second Report and Order* the structure of the VHF and UHF bands can be depicted as shown in Figures 1 and 2 below.

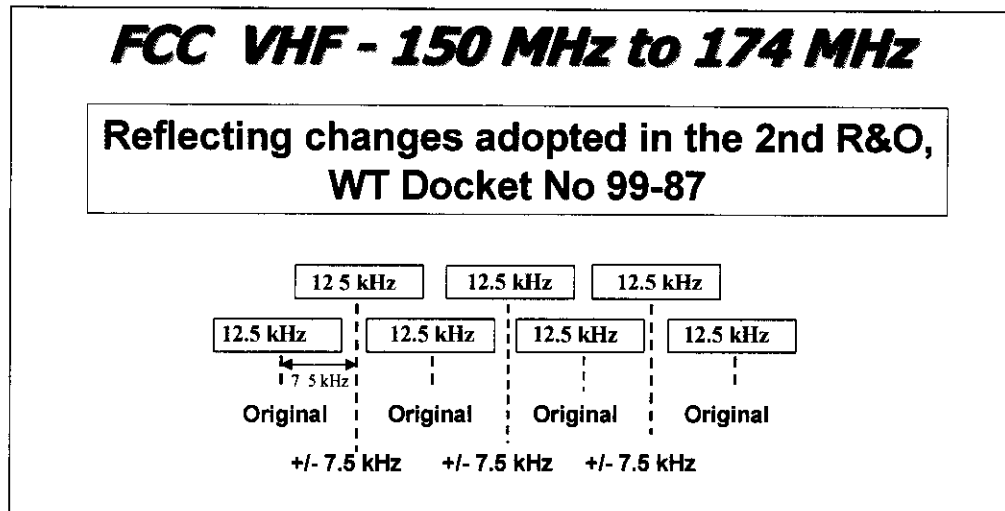


Figure 1.

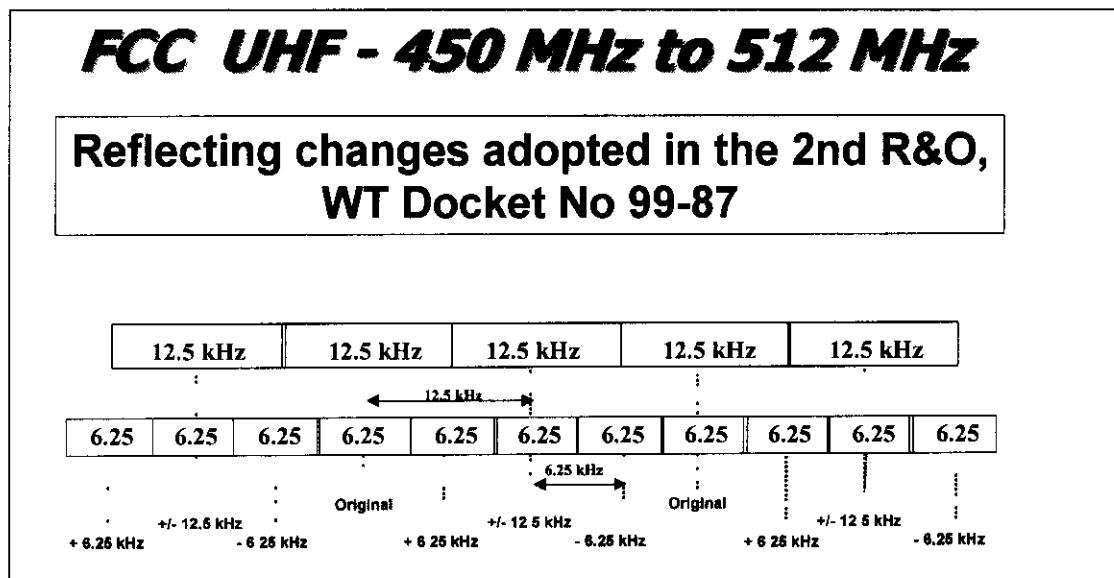


Figure 2.

The above figures reflect the fact the Commission, by the rules adopted in the *Second Report and Order*, simply has reduced the maximum authorized channel bandwidth to 12.5 kHz (11.25 kHz) on the channels identified as “original” channels in either band. The term “original” is intended to define those channels authorized or existing, prior to the VHF and UHF band restructuring and channel additions resulting from the *Refarming* proceeding.

Since the Commission has seemingly eliminated all VHF and UHF channels with an authorized bandwidth of 25 kHz, in order to resolve the errors and misinterpretations of the Commission in the *Second Report and Order* as noted previously, M/A-COM recommends the Commission implement an appropriate means of providing 25 kHz channels. Furthermore, providing a means to allow 25 kHz channels will also allow the Commission to foster its policy of technical neutrality, and will allow manufacturers to realize a return on R&D investment already incurred.

The method to provide 25 kHz channels, while at the same time minimizing the overlap problems between 25 kHz and 12.5 kHz (and subsequently 6.25 kHz) channel bandwidth operations, would best be attained by allowing the combination of two adjacent 12.5 kHz channels, as such exist after the *Second Report and Order*, to form a 25 kHz channel. This works well for the UHF structure existing after the *Second Report and Order*, but does not work as well for modifying the VHF structure because of the overlap resulting from 12.5 kHz channels being spaced on 7.5 kHz centers in the VHF spectrum. However, combining two adjacent VHF channels in the post-*Second Report and Order* structure will result in a 20 kHz channel, which is the authorized bandwidth for a 25 kHz channel as described in §90.209(b)(2). Thus the Commission could provide 25 kHz channels in the VHF portion of the spectrum by allowing combination of two adjacent 12.5 kHz channels, as such exist after the *Second Report and Order*, to form a 25(20) kHz channel in the VHF spectrum.

However, M/A-COM strongly believes the overall structure of the VHF spectrum should be changed to a structure similar to the proposed UHF structure, at the appropriate time. To minimize impact, this seemingly radical restructuring of the VHF spectrum should take place at the same time the efficiency mandates become effective on the respective user communities¹⁷.

¹⁷ Again, M/A-COM notes it believes these mandated transition dates for the user communities should be finally determined by the Commission based on input from the various user communities Petitions for Reconsideration

In any case, M/A-COM is prepared to take whatever steps are necessary to provide compliant equipment consistent with the dates finally determined.

It also should be noted the recommended restructuring charts below, shift the channel centers for 6.25 kHz bandwidth channels 3.125 kHz from the 6.25 kHz channel centers presently stated in the assumed post- *Second Report and Order* UHF structure. The purpose of the 3.125 kHz shifts is to make two 6.25 kHz channels the naturally resultant product of splitting a given 12.5 kHz channel. This change will also minimize the overlap problems between 12.5 kHz channels and 6.25 kHz channels in the post- *Second Report and Order* structure, particularly in the existing post- *Second Report and Order* UHF spectrum.

This channel center shift will have little or no effect on existing 6.25 kHz channel licensees. In fact, most if not all currently existing 6.25 kHz channel licensees have probably been cancelled due to failure to satisfy build-out requirements.¹⁸ At this time, most of the 6.25 kHz channel licenses were issued more than one year ago, however, they have likely not been placed into operation due to the non-availability of actual 6.25 kHz channel bandwidth equipment.

Furthermore, moving the 6.25 kHz channel centers 3.125 kHz and allowing 25 kHz channels through the combination of two adjacent 12.5 kHz channels, results in a UHF band structure, and a VHF band structure if the Commission adopts the total VHF band restructuring proposal, similar to the band structure established for the new 700 MHz public safety spectrum.

Figure 3 depicts a recommended VHF band structure assuming there is no overall VHF band restructuring. Note the structure shown in Figure 3 does not easily facilitate transition to 6.25 kHz technologies at some point in the future, as contemplated by the Commission in the

¹⁸ 47 C.F.R. §90.155(a) provides "All stations authorized under this part, ..., must be placed in operation within twelve (12) months from the date of grant or the authorization cancels automatically (emphasis added) and must be returned to the Commission

companion FNPRM¹⁹. Absent VHF band restructuring, similar to that shown for the UHF band in Figure 4 below, transition to 6.25 kHz technologies in the VHF band will provide significantly less than full benefits. {NB: The information in Appendix A is information that should be included in revisions to the existing §§ 90.20(c)(3) and 90.35(b)(3) VHF listings. Appendix A lists the VHF channel center frequencies and their associated channel numbers, assuming no band restructuring, for the purposes of calculating the combination limitation language discussed hereinafter. This petition does not contain a proposed channel listing and channel numbering schedule for a restructured VHF band. Restructuring the VHF portions of the band is beyond the scope of this petition. However, M/A-COM strongly recommends the Commission consider a full VHF restructuring. M/A-COM will work with the Commission to develop the exact structure in the event the Commission decides restructuring VHF, at an appropriate time is in the public interest.}

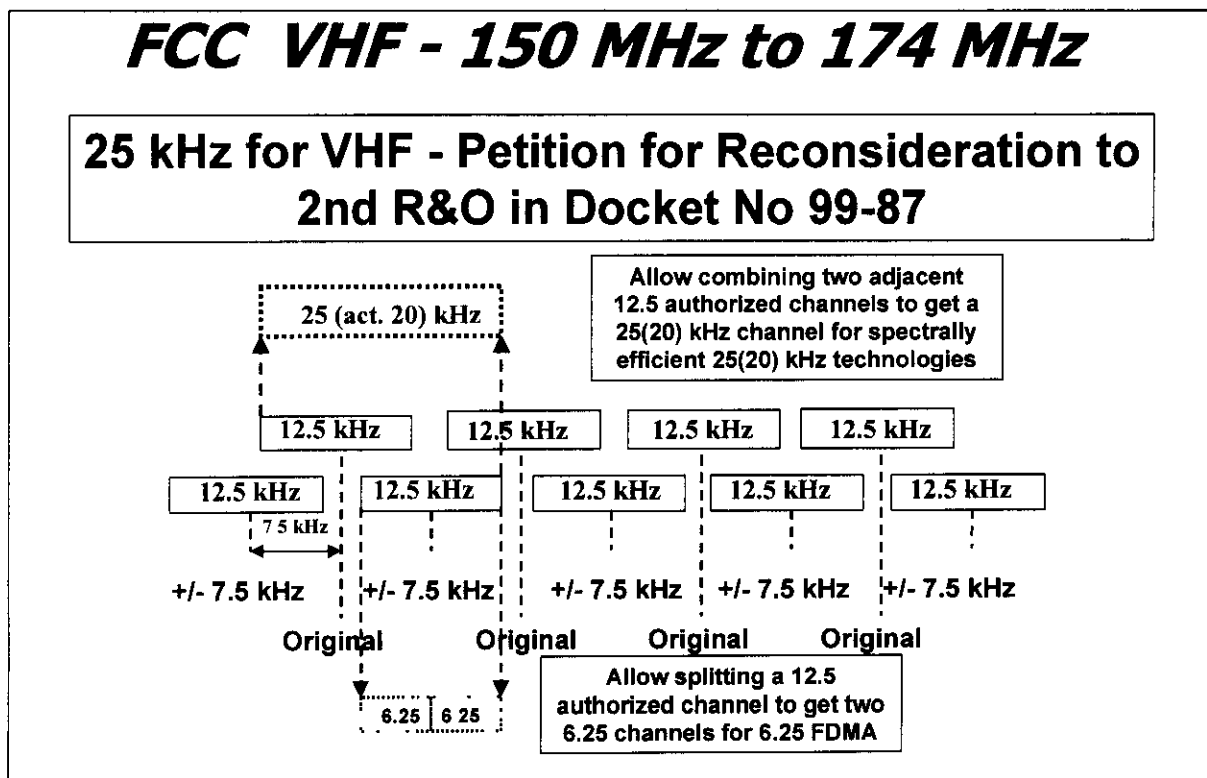


Figure 3.

¹⁹ See *Second Report and Order*, Section IV, paragraph 27. The Commission has tentatively concluded similar mandates for migration to 6.25 kHz technologies are warranted and has requested comment.

Figure 4 depicts a recommended UHF band structure. In addition to showing a combination of two adjacent 12.5 kHz channels in order to form a 25 kHz channel, Figure 4 also depicts the shift of 3.125 kHz in the 6.25 kHz channel centers. The structure shown in Figure 4 facilitates transition to 6.25 kHz technologies at some point in the future, as contemplated by the Commission in the companion FNPRM²⁰. {NB: The resultant channel centers, for the recommended UHF spectrum, are listed in Appendix B. The information in Appendix B is information that should be included in revised UHF channel listings for §§ 90.20 and 90.35.}

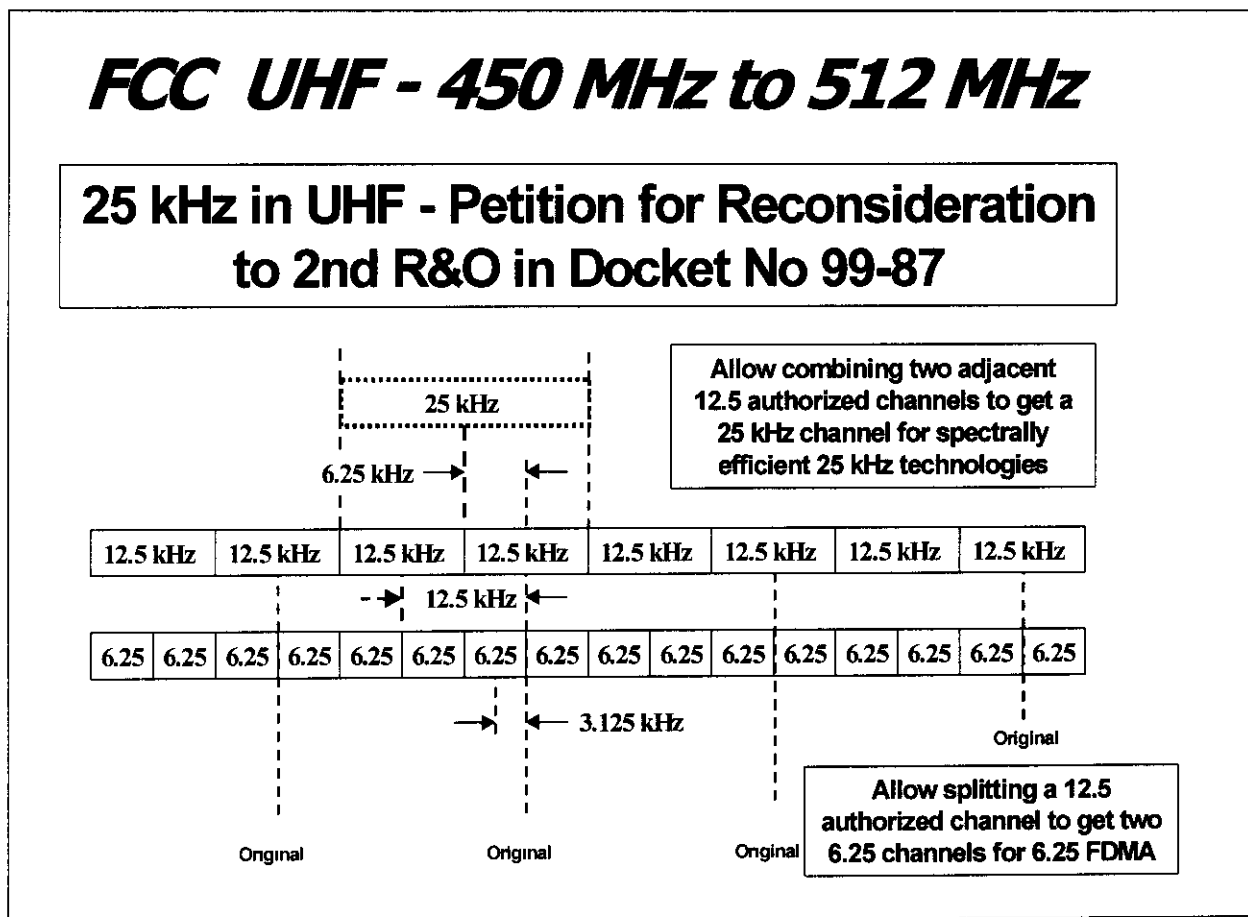


Figure 4.

²⁰ See footnote 19, *supra*

1. Recommended Changes to §§90.20 & 90.35

In Appendix A the 12.5 kHz channel centers are numbered, similar to the numbering schemes that are employed by the Commission in the 700 MHz public safety and the 800 MHz bands. In Appendix B the 6.25 kHz and 12.5 kHz channel centers are numbered, similar to the numbering schemes employed by the Commission in the 700 MHz public safety and the 800 MHz bands. This has been done to facilitate formulation of the appropriate limitations on the channels that can be used in combination to form 25 kHz channels. M/A-COM believes there should be necessary limitations, similar to the limitations outlined in the §90.531(d) for the 700 MHz public safety spectrum. M/A-COM does not recommend the Commission allow any two 12.5 kHz channels to be combined to form a 25 kHz channel. There must be some order.

M/A-COM recommends §§90.20 and 90.35 be modified to appropriately indicate the allowed combinations for the spectrum to provide 25 kHz channels. For the Public Safety pool VHF (150-174 MHz frequencies) assuming there is no major VHF band restructuring as recommended earlier, M/A-COM recommends §90.20 be changed as follows:

- Existing §90.20(c)(3) be renumbered to §90.20 (c)(5).
- A new §90.20 (c)(3) be added to read:
“(c)(3) Combining VHF (150-174 MHz) channels. Adjacent 12.5 kHz channels may be used in combination in order to accommodate requirements for larger bandwidth emissions, in accordance with this paragraph. Designated interoperability channels may not be combined with non-designated interoperability channels. Any 25 kHz channel must comply with all limitations listed in §90.20(c)(5) as applicable to either component 12.5 kHz channel.
(i) Beginning January 1, 2018 subject to compliance with the spectrum usage efficiency requirements set forth in §90.203(j)(3), two contiguous 12.5 kHz channels may be used in combination as a 25 kHz channel. The lower (in frequency) channel for two 12.5 kHz channel combinations must be an odd (i.e., 1, 3, 5 * *) numbered channel. Channel combinations are designated by the lowest and highest channel numbers separated by a hyphen, e.g., “1-2, 3-4, ***” for a two channel combination.”
- A new §90.20 (c)(4) be added as discussed hereinafter.

For the Industrial/Business Radio pool VHF (150-174 MHz) frequencies, assuming there is no major VHF band restructuring as discussed earlier, M/A-COM recommends §90.35 be changed as follows: